

HOSPITAL AND MEDICAL FACILITIES SERIES
(Under the Hill-Burton Program)

bibliography

HOSPITAL UTILIZATION STUDIES

Selected References Annotated

Prepared by
ANNE STAGEMAN
ANNA MAE BANEY

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service
Division of Hospital and Medical Facilities
Program Evaluation and Reports Branch
Washington 25, D.C.

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Public Health Service Publication No. 930-G-4

September 1962

For sale by the Superintendent of Documents, U.S. Government Printing Office,
Washington 25, D.C. Price 25 cents

FOREWORD

Experience gained during the past 15 years of the Hill-Burton Program reveals that hospital bed needs should no longer be established primarily on the basis of fixed bed/population ratios. Instead, our ever-changing health problems call for the use of more sophisticated methods and techniques in determining needs. Hospital utilization data are important indicators in developing such methods and techniques.

In addition to hospital utilization information, increasing recognition is being given to the importance of a wide variety of other factors which influence health facility planning. These include population trends, socioeconomic status, methods of payment, the increasing complexity of health facilities, new patterns of care, and the availability of health personnel. All of these factors must be considered in their proper perspective before a judgmental decision can be reached as to a community's actual hospital needs.

To assist community and areawide planning groups in developing their own indices of hospital bed needs, we have compiled this bibliography of hospital utilization studies and the knowledge derived from these studies.

HOSPITAL UTILIZATION STUDIES

1. Anderson, Odin W. and Sheatsley, Paul B. Comprehensive Medical Insurance: A Study of Costs, Use, and Attitudes under Two Plans. Health Information Foundation Research Series 9. New York, N.Y., Health Information Foundation, 1959. 105 pp.

This study reports the results of a survey of randomly selected members of three trade unions, who, individually, had been given the choice between two health insurance plans. Both plans covered the full range of physicians' services. One plan, Group Health Insurance, Inc., allows free choice of physicians who are reimbursed in accordance with a payment schedule. The other, the Health Insurance Plan of Greater New York, provides care to its subscribers at any of 31 medical groups. Within each panel group, free choice of a family physician is allowed. Members of both groups received identical Blue Cross hospital benefits.

The purpose of the study was to determine the subscriber attitudes and use of services under two different methods of organizing medical services. For comparison purposes, samples of subscribers to the two plans were matched for age, sex, family size, and educational level. For each plan, 450 cases were selected.

The study revealed that the average gross cost of all health care for a year was substantially higher for G.H.I. enrollees than for H.I.P. enrollees, being \$154 and \$139, respectively. Broken down by type of service, it was found that the costs for hospital care and hospital-ized surgery were significantly higher for the G.H.I. members. These average costs for each individual in the two groups were: hospital care, G.H.I. enrollees \$23, H.I.P. enrollees \$13; hospital surgery, G.H.I. members \$11, H.I.P. members \$5. Other types of services showed similarity in comparative costs.

The total costs for a family for the study year were \$356 under G.H.I. and \$321 under H.I.P. G.H.I. enrollees had 11 hospital admissions and 87 days of hospitalization per hundred persons in a year; H.I.P. enrollees had 6.3 admissions and 41 days per hundred persons. The mean length of stay per admission for G.H.I. enrollees was also higher, 8.0 days, while for H.I.P. enrollees the stay was 6.5 days.

Interviews with the study population disclosed that the large majority of people were satisfied with the health insurance plan in which they were enrolled. However, a larger minority of H.I.P. respondents were dissatisfied either with the plan or with the doctors. The subscribers were also questioned as to the reasons for their choice of plan.

2. Anderson, Odin W. and Feldman, Jacob J. Family Medical Costs and Voluntary Health Insurance: A Nationwide Survey. New York, N.Y., McGraw-Hill Book Company, Inc., 1956. 251 pp.

The authors conducted a survey in July 1953, based on single interviews of 2,809 families in their homes, representing a national sample of the population. It is stated that the survey was limited to an analysis of the financial aspects of personal health services, and that the purpose of the survey was to learn what effects the present range of benefits offered by

voluntary insurance have on the increasing costs of personal health services and on the utilization of services.

Among the findings reported by the authors concerning hospital utilization are:

The general hospital admission rate for the country as a whole was 12 per 100 population per year. The admission rate for persons with hospital insurance was 14 and for those without such insurance 9.

For the general population, including both insured and uninsured persons, the hospital admission rate for different income groups shows little variation. In fact, the highest-income group shows indications of having a lower admission rate than other income groups.

Hospital admission rates in urban and rural areas have reversed themselves during the past 20 years, so that now rural areas have a higher admission rate than urban areas.

The mean length of stay for all hospital admissions was 7.4 days per person. Persons with insurance had a shorter length of stay than those without insurance, 7 and 8.3 days, respectively.

In the general population, 90 hospital days were utilized per 100 persons. The rate for persons with insurance was 100, and for those without insurance, 70. Apparently the increase in hospital days among the insured is attributable to increased female utilization, since insured and uninsured males both have a utilization rate of 70 days per 100 persons, and insured and uninsured females have a rate of 120 and 80 days per 100 persons, respectively.

The number of hospital days per 100 persons by family income shows no consistent relationship for the general population. Among insured families, however, the lower the income the greater is the number of days utilized. Among families without insurance the higher the income, the greater is the number of hospital days utilized, with the apparent exception of the lowest-income group.

3. U.S. Department of Health, Education, and Welfare, Division of Public Health Methods. Sources of Morbidity Data, Listing Number 8. Washington, D.C., 1960. P. 31.

The descriptive abstract of a utilization research project is quoted in its entirety.

"A-259 A survey of hospital utilization in Massachusetts (5/11/60)

"Purpose: The purpose of this study is to describe the role and function of the hospital today through analysis of factors affecting the decisions leading to admission and discharge in a representative sample of hospital admissions in one State. Special attention will be devoted to the non-medical factors influencing such decisions.

"Types of data: Data will be gathered on the onset and circumstances of the illness, the amount and kinds of medical care received prior to hospitalization, the chain of events leading to the decision to enter the hospital, relevant environmental considerations, factors affecting the length of stay, and attitudes toward the hospitalization experience.

"Population: Over the course of a one-year period, approximately 2,500 recent ex-patients of general and special short-stay hospitals in Massachusetts will be studied. In addition, their physicians will be interviewed, as well as a representative sample of the adult public of the State. The sample of 2,500 ex-patients will be drawn from 50 hospitals representative of the State as a whole with respect to size, location, ownership, and average length of stay.

"Method of obtaining data: The chief method of obtaining data will be the personal interview. Additional data, principally concerned with diagnosis and hospital costs, will be obtained from records.

"Stage of progress: A pretest involving 100 cases has been completed. Final versions of the questionnaires are in preparation and field work is expected to start in June 1960. (Apr. '59 - Apr. '62)

"ORGANIZATIONS: Health Information Foundation; National Opinion Research Center, University of Chicago.

"PRINCIPAL INVESTIGATORS: Anderson, Odin W., Ph.D., Director of Research, Health Information Foundation. Sheatsley, Paul B., Eastern Representative, National Opinion Research Center.

"PUBLICATION PLANS AND REFS.: There are no definite publication plans as yet.

"FOR FURTHER INFORMATION: Paul B. Sheatsley, Eastern Representative, National Opinion Research Center, 100 Fifth Avenue, New York 11, New York."

4. Becker, Harry F., M.D. Controlling Use and Misuse of Hospital Care. Hospitals 28:61-64, December 1954.

The author analyzes the factors contributing to the rise of the total cost of hospital care to the public, and states that perhaps the largest factor is "the growing tendency to use inpatient care for more and more patients, for less and less necessity." He attributes this practice to the increasing number of people who have prepayment hospital plans. This freer use of hospitals has increased the cost of voluntary hospital plans to the point where a smaller number of low-income families can afford this coverage.

The results of a study by the Michigan State Medical Society and the Michigan Blue Cross to investigate "the mounting use of hospital beds" are discussed. Some of the findings include:

Patients paying their own bills showed faulty use in less than 14 percent of admissions.

Commercially-insured patients misused their hospital stays nearly 30 percent of the time.

Blue Cross members misused their hospital stays in nearly 36 percent of cases.

Nearly 1 out of 5 days used by Blue Cross patients was not a necessary day.

Patients who used unnecessary days needed the care received, but hospitalization was not necessary for their diagnostic, medical, or surgical care, the author states. "One out of eight Blue Cross patients entered the hospital for laboratory or X-ray examinations, although hospital outpatient departments were performing similar examinations on similar patients every day." The study pointed out that beds wasted by unnecessary use must be replaced by new construction.

To counteract the increasing cost of hospitalization, the author recommended that:

General hospitals expand and perfect their existing outpatient facilities.

Convalescent sections be provided, since about 60 percent of the patients in most general hospitals are convalescing. Such units cost less to construct and less to operate.

A contract which provides outpatient services be furnished under prepayment plans.

5. Brown, Ray E. Let the Public Control Utilization through Planning. Hospitals 33:34-39, 108, 110, December 1, 1959.

In recent years the monthly charges for prepayment coverage have constantly risen because of increases in operating costs of hospitals and in hospital usage. These factors, however, cannot be controlled, the author states, by limiting prepayment rates, since inadequate financing will not reduce the demand for hospital care unless it would be so extreme as to cause serious deterioration in the quality of care.

Rather, the author believes, the only effective means of controlling hospital utilization and operating costs is by controlling the supply of beds. This can be done through planning so as to avoid unnecessary duplication and mislocation of hospital facilities and through the more efficient use of hospitals.

The author points out that the largest proportion of unutilized beds is in the smaller hospitals, that the average occupancy rate increases with the size of the hospital. Since an unused bed costs approximately 50 percent as much to maintain as an occupied bed, the use of larger hospitals with their higher occupancy rates would mean lower operating costs. In addition, the unnecessary duplication of services would be avoided.

Inefficient use of hospitals results from (1) unwise scheduling of the patient who may choose his time of admission or (2) the unnecessary hospitalization of the patient. Efficient use is principally a matter of the number of hospital beds which are available. Fewer available beds will cause more judicious use of the hospital facilities.

The author suggests that the control of the supply of beds can be done through the franchising of hospitals by a State agency. Thus the public could control the manner in which it builds and uses its hospitals.

6. Chill, Don. It's Your Choice. Nursing Homes 9:6-8A, November 1960.

The author was involved for three years in a nationwide study to determine the needs of patient centers. Opinion surveys and statistical and documentary studies were used for this project. During the study, it was found that interest in the nursing home was rising rapidly.

Between January 1, 1957 and January 1, 1960 the percentage of gain in the number of general hospital beds was 11 percent, as compared to a gain of 50 percent for nursing home beds. Construction of nursing home beds, the author believes, will in all likelihood soon surpass construction of general hospital beds.

In the study it was determined that 2.7 nursing home beds per 1,000 population appeared to be a working ratio for the nation as a whole. The author believes that if this ratio were maintained and all other variables held constant, only 3.5 to 4.0 general hospital beds per 1,000 population would be needed. With a ratio of 3.5 instead of 4.5 per 1,000 population for general hospital beds, the savings in building the needed general hospital beds would amount to \$3.5 billion.

Proper utilization of the nursing home for mental patients would also lead to a downward revision in the number of mental hospital beds needed per 1,000 population, the author observed. Nursing homes offer services which also could be utilized by convalescent patients in general hospitals, if the nursing homes were conveniently located for use by physicians and patients and if this type of care were covered by health insurance.

Nursing homes are seen as providing an answer to both the high cost of original construction and the rising costs of patient care. The author recommends emphatically that nursing homes not relinquish their major attribute -- economy in patient care. He points out that nursing homes are not hospitals and should not be made minor hospitals. It is not a function of the nursing home to give intensive physical rehabilitation or to provide X-ray facilities,

nor should they strive for a high standard of professional nurse service. Registered professional or licensed practical nurses should supervise the work of the aides. A patient who needs continual supervision by a registered nurse should not be in a nursing home.

The author discusses nursing home standards. One of the most important, he states, is that of physician services. Each patient should be visited at least once a month by a physician. The author also stresses the importance of complete medical records, good diet, and the provision of recreational or occupational therapy.

7. Densen, Paul M.; Balamuth, Eve; and Shapiro, Sam. Prepaid Medical Care and Hospital Utilization. Hospital Monograph Series No. 3. Chicago, Illinois, American Hospital Association, 1958. 55 pp.

A study was made of the hospitalization experience in 1955 of two groups having the same hospital insurance coverage, but different medical insurance coverage. The purpose of the study was to determine the influence of a program of comprehensive insurance for medical care upon hospital utilization. The two groups studied were the Health Insurance Plan of Greater New York (H.I.P.) and the United Medical Service (Blue Shield). A detailed description of the groups by the authors states:

"H.I.P. is provided with comprehensive coverage against the costs of medical care both in and out of the hospital, the care being provided by doctors associated with medical groups; the other population is insured under the Blue Shield contracts for surgical and maternity care and a little more than a third of this group is covered in addition for other in-hospital medical care. The medical care for those insured under the Blue Shield contract is provided in the main on a solo practice basis. Both populations are insured against hospital costs under the same type of group contract with Blue Cross."

Among the findings of this study:

Annual number of 1955 hospital admissions per 1,000 population:

Blue Cross - H.I.P.	77.4
Blue Cross - Blue Shield	95.8

Annual hospital admissions by sex per 1,000 population:

Males - Blue Cross - H.I.P.	54.0
Blue Cross - Blue Shield	70.8

Females - Blue Cross - H.I.P.	101.2
Blue Cross - Blue Shield	118.7

Duration of hospital stay:

Blue Cross - H.I.P.	7.6 --,-
Blue Cross - Blue Shield	7.2 days

These data are further analyzed by rates of admission by matched employment groups, by diagnosis, by surgical and nonsurgical conditions, and by other factors.

8. Densen, Paul M.; Jones, Ellen W.; Balamuth, Eve; and Shapiro, Sam. Prepaid Medical Care and Hospital Utilization in a Dual Choice Situation. American Journal of Public Health 50:1710-1726, November 1960.

This study analyzes the comparative hospitalization experience of members of a union under two different medical care plans for which they were eligible under a dual choice arrangement. The plans, Group Health Insurance and the Health Insurance Plan of Greater New York, offer essentially the same coverage. However, they differ in the organization of medical practice. Members are insured against hospital costs with the same type of group contract with Blue Cross.

The annual adjusted hospital admission rate was 70.2 per 1,000 for the population covered by H.I.P. and 88.3 per 1,000 for G.H.I. for the period July 1, 1956 - June 30, 1957. For the same period, the adjusted annual number of paid days in hospital per 100 population was 74.4 for H.I.P. and 95.5 for G.H.I. The adjusted surgical admission rate was also higher for both males and females under Group Health Insurance.

In discussing the findings of this study the authors presented possible explanations for the differences in hospital utilization under the two plans.

9. Dickerson, O.D. Health Insurance. Homewood, Illinois, Richard D. Irwin, Inc., 1959. 500 pp.

This study presents data on the impact of health insurance on hospital utilization. The author states that with the increasing enrollment under hospital insurance plans has come an increase in the cost of hospitalization and in the degree of utilization. From 1952 to 1956 the percentage increase in the number of hospital admissions was 5.1 percent greater than that of the population increase. The 1946 admission rate per 1,000 persons was 112 compared with 132 in 1956. The average cost per patient stay rose 112 percent from 1946 to 1956.

Factors cited as contributing to these increases were population growth, the greater cost of hospital operation and increased utilization of hospital services. The general rise in incomes and the existence of hospital insurance have contributed to the increased ability to pay for hospital services, thus leading to greater utilization.

The author states "to the extent to which the possession of insurance encourages prompt treatment and reduces the ultimate toll of poor health, this is a desirable phenomenon. To the extent to which higher admission rates result from unnecessary utilization of services merely because they are free, it is undesirable."

In addition to increased frequency and duration of use which cause overutilization, higher charges are being made than would otherwise have been imposed. "Hospitals and physicians have traditionally defended their right to charge patients in accordance with type of accommodation and ability to pay. Unfortunately, they frequently seem to consider insurance coverage as evidence of increased ability to pay rather than a plan whereby payments have already been made."

The author lists these reasons for excessive cost: unnecessary admissions, unnecessary use of diagnostic and treatment aids, unnecessarily long periods of stay, and unnecessarily high charges for services rendered.

To discourage excessive utilization, the author recommends the use of insurance policy provisions which would require the patient to bear a portion of the expenses himself.

10. U.S. Department of Health, Education, and Welfare, Division of Public Health Methods. Sources of Morbidity Data, Listing No. 8. Washington, D.C., 1960. P. 21.

The descriptive abstract of a research project is quoted in its entirety.

"A-243. Health services and their use in upstate New York (4/4/60)

"Types of data and purpose:

1. To compile a comprehensive inventory of health resources at the county and community levels for six representative counties in upstate New York which were originally studied during 1949-51.
2. To compare the findings from the present inventory with that of the original study.
3. To study the use made by rural people of the available medical and health services and facilities in the six selected counties.
4. To compare (a) the extent and way health and medical resources are currently utilized by a cross-section of rural people with the use pattern of a cross-section at the time of the earlier study, and (b) the use patterns of identical persons currently with use patterns at the time of the earlier study. This will also lay a foundation for a comparable study at a later third point in time.
5. To study the use of available medical and health services by a representative sample of urban people in the six selected counties.

6. To compare the extent and ways that health and medical resources are utilized by urban people with the use patterns of the rural population.
7. To interpret changes and stabilities in the inventory of health resources.
8. To develop a valid measure of the change in health services and facilities for a county.

"Population: The selection of informants for the rural segment of the study was based on the sampling procedure followed in the original survey. The rural segment included persons residing in centers up to 2,500 persons as well as those residing in the open-country outside of these centers. The sample of households was drawn systematically from the identical sample units used in the original survey. Proportionate representation was given to the open country and village areas. The typical interviewee was the homemaker.

"The urban sample is drawn from all localities with a population of 2,500 or over in the six counties. In selecting the urban sample, efforts are being made to approximate the size and to maintain the representativeness obtained in the rural sample.

"Method of obtaining data: A schedule has been designed and interviews are conducted with rural and urban inhabitants to obtain information on use patterns and health needs and the social and economic factors related to the utilization of health and medical resources.

"An inventory of health and medical facilities and services is obtained by interviewing, and from primary and secondary sources.

"Stage of progress: Analysis has been completed on the rural phase for Cortland and Oswego counties. A statistical supplement has been prepared and a narrative report will be released in June. The Chautauqua - Livingston data on rural households have been coded and analyzed. A statistical supplement is being prepared and will be released in June 1960. Coding and analysis is now being undertaken on the urban phase for Cortland and Oswego and the rural phase of Clinton and Ulster counties. The urban sample design will be completed and an enumerative survey of households will be made in all urban localities in Chautauqua and Livingston counties beginning in April 1960. (Oct. '57 - June '61)

"ORGANIZATION: Department of Rural Sociology, Cornell University.

"PRINCIPAL INVESTIGATORS:

Ellenbogen, Bert, Ph.D., Assistant Professor, Department of Rural Sociology

Larson, Olaf F., Ph.D., Professor, Department of Rural Sociology.

"PUBLICATION PLANS & REFS.:

"Changes in the Availability and Use of Health Resources in Two Central New York Counties, 1949 and 1957" -- Statistical Report (June) 1959.

"Changes in the Availability and Use of Health Resources in Two Central New York Counties, 1949 and 1957" -- (June) 1960.

"Changes in the Availability and Use of Health Resources in Two Western New York Counties, 1950 and 1958" -- Statistical Report (June) 1960.

"FOR FURTHER INFORMATION: Dr. Bert Ellenbogen, Assistant Professor, Department of Rural Sociology, Cornell University, Ithaca, New York."

Forsyth, Gordon and Logan, Robert F.L., M.D. The Demand for Medical Care: A Study of the Case-Load in the Barrow and Furness Group of Hospitals. New York, N.Y., Oxford University Press, 1960. 153 pp.

This survey was made in an English industrial area, chosen because it was geographically and medically isolated, with the hospital population easily defined. Among the purposes of the survey were to analyze the year's caseload by diagnosis to facilitate comparison with findings in other areas, to attempt a forecast of the demand for hospital facilities in the area in approximately 20 years' time, and to formulate a stricter definition of need.

It was found that effective demand is not necessarily identical with medical needs. Quarterly tours of the wards were made, in which the clinical necessity for admissions was assessed. Forty-two percent of the women and 25 percent of the men in general medicine, 60 percent of the patients in general surgery, and 23 percent of those in pediatrics were, on clinical grounds alone, in need of inpatient care. The care provided the remainder could have been given to them only as inpatients or the classification was doubtful.

Applying a method developed in earlier studies, it was suggested that 2.5 beds per 1,000 population were sufficient to meet the needs of the available acute specialties in the area. When the estimate of beds needed was adjusted to take into account the clinically necessary admissions, a ratio of 2.3 beds per 1,000 population was suggested.

Hayes, John H., (Ed.) Financing Hospital Care in the United States. Volume I, Factors Affecting the Costs of Hospital Care. New York, N.Y., The Blakiston Company, Inc., 1954. 300 pp.

This volume presents a report of the Commission on Financing Hospital Care. It includes discussions of methods of increasing the effective utilization of hospital services and facilities as a factor in controlling costs.

To prevent wasteful duplication in providing comprehensive services to a community, joint action should be taken by hospitals to achieve coordination of services wherever possible. Specific methods by which hospitals may cooperate are outlined.

Since, it is stated, physicians control the patient admission rate, the quantity of services provided, and the length of stay, it is recommended that they recognize the economic factors involved in their use of hospital facilities, in order to reduce the costs of hospital care.

As evidence of over-utilization of inpatient hospital facilities, some results of a survey of 12,000 consecutive medical records from hospitals in representative areas of Michigan are presented. Instances of overstay, admission for medical inventory, and hospitalization for the convenience of the patient or his family were found in about one-fourth of the study cases. Also, although excessive use of drugs and diagnostic facilities was not studied statistically, it was noted that many evidences of such excessive use were found. Results of another study which showed unnecessary admissions, unnecessarily long stay, and excessive use of diagnostic procedures, are quoted.

The effect of increased utilization due to regulations by some medical and hospital prepayment plans which limit benefits to those enrollees who receive inpatient hospital care is noted. Reference is made to a survey of 10,000 Blue Cross subscribers in the Pittsburgh area who had been hospitalized, which revealed that "one out of ten subscribers would have been treated at home if his hospital bill had not been prepaid through Blue Cross."

The author suggests 14 measures to decrease over-utilization, including the expansion and improvement of outpatient services, instruction concerning the costs of hospital care in intern and residency training programs, and educational programs by prepayment agencies on the direct relationship between hospital utilization and premium rates.

"The most productive way to minimize the cost per day is to stabilize the hospital workload at a level most favorable for operating efficiency," the author states. He adds that this may be achieved "by stabilizing the average daily census as far as is possible and reducing the total number of beds in the hospital to conform with the stabilized census."

13. Kelly, Denwood N. Experience with an Out-of-Hospital Diagnostic Program. Maryland State Medical Journal 8:80-81, February 1959.

To determine the effect on hospital utilization of a program whereby diagnostic services would be made available in doctors' offices or hospital outpatient departments, a study of hospital usage was made for the year preceding and the two years following the granting of such benefits under Blue Cross-Blue Shield to a group of employees (averaging 123,000).

Three measurements were used in comparing hospitalization experience for the three years: the number of inpatient admissions per year per 1,000 subscribers, the average length of stay per admission, and the average number of days of care used by each 1,000 subscribers per year.

The comparative hospital usage by these three methods of measurement were tabulated by the author.

	Study Period		
	First 12-month period	Second 12-month period	Third 12-month period
Inpatient admissions per 1,000 subscribers	97	103	107
Average length of stay per inpatient admission (days)	7.69	7.58	7.92
Days of care per 1,000 subscribers	749	784	850

The author states that the assertion has often been made that Blue Cross could effect substantial savings by the type of diagnostic program benefits granted to the study group, since it would eliminate "unnecessary" hospital admissions. However, as the analysis shows, rather than a decrease in hospital utilization by the group, there was a marked increase.

The author concludes that one of the reasons for this increase was the detection of previously unsuspected diseases through the use of the outpatient diagnostic program. He believes that such a program means better total health care, but that it should not be made available under the belief that its inclusion will mean little or no additional cost.

14. Koos, Earl Loman. The Health of Regionville. New York, N.Y., Columbia University Press, 1954. 177 pp.

Approximately 500 families in one rural community and its outlying area were interviewed over a 4-year period to obtain the data for this study. Among other criteria for the choice of the community was its "averageness."

The assumption was made that social class membership is important in determining human behavior, including differences of behavior and thought concerning illness and health. Accordingly, the 514 households (selected on a random basis) were divided into three sections. Class I members consisted of households of business and professional men; Class II members, those of skilled and semi-skilled workers; and Class III, laborers.

Each group was analyzed as to its use of hospitals, physicians, dentists, and nonmedical personnel. In almost every examination of opinions, attitudes, and behavior in health and illness, a significant difference appeared among the three socioeconomic classes. A variety of factors, many of which were associated with, if not caused by, social-class differences, prevented the community from having the best possible health care, the author stated.

15. Lerner, Monroe. Hospital Use and Charges by Diagnostic Category. Research Series 13. New York, N.Y., Health Information Foundation, 1960. 32 pp.

This study was conducted to determine "the extent to which hospital use and charges result from specific diagnostic categories of illness conditions or injuries." To obtain such data a study was made of the hospital experience of 843,046 persons enrolled under one plan of the Blue Cross Hospital Service of Indianapolis, Indiana.

Hospital use was measured through admissions, average length of stay, and patient days; costs through average daily charges, average bill per admission, and annual costs averaged over the total 843,000 subscribers, whether or not they were hospitalized.

Of the population studied, there were 115.5 hospital admissions per 1,000 persons. The major diagnostic categories were obstetrical care, 24.0 admissions; respiratory disease, 18.7; digestive diseases, 18.0; genitourinary diseases, 14.1; circulatory diseases, 8.5; and accidental injuries, 7.2.

The average length of stay was 7.3 days. The longest average stay by diagnostic category (15.5 days) was for cancer. The second and the third longest average stays were for mental disorders (15.2 days) and early infancy diseases (14.8 days). The annual total use of hospital services averaged 838.8 days per 1,000 subscribers (slightly over 0.8 days per person).

The average hospital charge for the study group was \$22.91 for each inpatient hospital day. The average cost per admission was \$166.00, and the total hospital bill averaged for the 843,000 subscribers was \$19.22. All of these measurements of cost are analyzed as to major diagnostic categories.

Hospital utilization and costs are also tabulated by age group and sex and further analyzed according to diagnostic category by age group.

The author states that although the study population is not a wholly representative cross-section of the United States, "it is large enough to furnish at least some reasonable idea of the patterns which might be found in other insured populations."

16. Lerner, Monroe. Hospital Use by Diagnosis: A Comparison of Two Experiences. Health Information Foundation Research Series 19. New York, N.Y., Health Information Foundation, 1961. 48 pp.

This study was conducted to determine whether the variation in volume of hospitalization is associated with a corresponding variation in the medical diagnoses leading to hospitalization, or if the differences at all levels of hospitalization are confined merely to the volume of use.

To obtain the data for this study, the 1956 hospitalization experience of 843,046 persons enrolled under the Blue Cross Hospital Service in Indiana and the hospital experience during 1957 of 827,698 persons covered under the Saskatchewan Hospital Services Plan in Canada were compared. The policy of the Blue Cross subscribers covered a maximum of 120 days of hospital care per admission, except for a limit of 30 days for the treatment of pulmonary tuberculosis or mental disorder. No limit was placed on the amount of hospital care which might be received by beneficiaries of the Saskatchewan Hospital Service Plan.

The total size and the sex composition of the two populations were similar. However, there was a marked difference in the age population, since those persons 65 and over comprised 9.4 percent of the Saskatchewan group and only 2.7 percent of the Indiana group.

The three measurements of utilization were: admissions per 1,000 population, average duration of hospital stay per admission, and the number of patient days in the hospital per 1,000 population.

By all three measures, hospital use by the Saskatchewan study group exceeded that by the Indiana group. Hospital admissions per 1,000 were 208.8 for the former, 115.5 for the latter. For the two groups, the average length of stay was 10.1 and 7.3 days, respectively, while the average number of patient days in the hospital per 1,000 persons was 2,107.3 and 838.8. When the rates of hospital usage in Saskatchewan were computed with the age and sex composition of the Indiana population as their base, utilization in Saskatchewan still exceeded that in Indiana markedly.

The six major diagnoses recorded for hospital admissions were the same for both populations, though there was a difference in rank order. The average length of stay was higher in Saskatchewan for nearly all diagnoses. In this category, four of the six leading diagnoses for the two populations were identical, but they differed in rank order.

The leading major diagnoses of the two study groups are recorded by each measure of hospital use by age group and further tabulated according to sex and age group.

17. Letourneau, Charles U., M.D. and Ulveling, Melinda. Vacant Hospital Beds -- A Study of Occupancy. Hospital Management 88:48-50, October; 88:43-45, 126, November; and 88:44-45, 98-100, December 1959.

The authors of this article are concerned with the continuing annual expense of maintaining unoccupied excess hospital beds. They quote an Ohio report ^{1/} which places the cost of operating each unoccupied bed which is not needed at \$6,700 per year. This Ohio report also stated that the availability of beds beyond those needed is likely to encourage unnecessary hospitalization, which further increases the cost of operating the unneeded beds, since the annual cost of operating an occupied bed is more than \$8,750.

The writers state that a large reserve of empty beds, which was suitable years ago, is no longer required, because of changing conditions. In the United States there were 249,000 vacant beds on the average in 1958. They believe this is far too large a number and they seem to feel that if every hospital in the United States maintained an average of five beds for emergencies, this would be sufficient.

In a comparison of the number of vacant beds by classification of service, it was found that the largest number (158,888) was in the short-term hospitals, mostly in the voluntary hospital group. The average percentage of vacancy in the voluntary short-term hospitals was 24.2.

A comparison of the number of vacant beds in short-term hospitals of different sizes indicated that the smallest hospitals do not function as efficiently, percentagewise, as the larger ones. However, the authors state that the greatest number of wasted beds occurred in hospitals which ranged from 50 to 199 beds.

The authors believe that there was sometimes a lack of foresight in the planning of the hospital system, that at times facilities have been established which the people of the community could neither use nor pay for. At other times the effects of proper planning have been nullified by changing circumstances within a community.

Among the causes of vacant beds listed are duplication of services, overspecialization, and required segregation of patients.

^{1/} Citizens' Hospital Study Committee of Northeast Ohio, Hospitals and Their Use in Northeast Ohio.

18. London, Morris and Sigmond, Robert M. Are We Building Too Many Hospital Beds? The Modern Hospital 96:59-63, January 1961.

Under the research grant program of the Hospital and Medical Facilities Division, U.S. Public Health Service, the Hospital Council of Western Pennsylvania conducted a study to provide detailed information about factors which affect bed occupancy. The need for this study is demonstrated by the fact that in the non-Federal general hospitals of the United States in 1960 there was an average daily total of 150,000 empty beds.

Census statistics were compiled for 14 short-term general hospitals over a period of 121 days. The occupancy rates in these hospitals ranged from 74 to 91 percent, with an average combined occupancy rate of 83. The authors observed that if each of the study hospitals had maintained the 91 percent occupancy rate attained by two of the hospitals, it would have been possible to close down 315 beds.

The study focuses on hospital vacancy rates, defined as follows:

- (1) the total vacancy rate, the average percentage of bed complement that is unoccupied (the difference between 100 and the occupancy rate);
- (2) the constant vacancy rate, the percentage of beds that are vacant every day,
- (3) the variable vacancy rate, the average percentage of beds that are unoccupied sometimes because of day-to-day fluctuations in the hospital census.

The total vacancy rate for the 14 hospitals ranged from 9 to 26. In seven of the 14 hospitals, one-third of the average number of vacant beds was vacant continuously.

The variable vacancy rate ranged from 6 to 22 percent among the 14 hospitals. It was no more than 10 percent in the six hospitals with the highest occupancy; however, it was above 11 percent in the eight hospitals with lowest occupancy. A tentative conclusion is offered that the variable vacancy rate might be lessened through administrative control. It is suggested that hospitals with a high variable vacancy rate consider a reduction in the number of beds to the extent indicated by the constant vacancy rate plus the number that will reduce the variable vacancy rate to 10.

The authors conclude that occupancy rates in some hospitals can be increased significantly by closing down beds either temporarily or permanently, since "some hospitals may simply have too many beds in relation to the maximum effective demand of the population served by the medical staff."

19. London, Morris and Sigmond, Robert M. Small Specialized Bed Units Lower Occupancy. The Modern Hospital 96:95-100, May 1961.

This article presents preliminary findings and conclusions resulting from a study of hospital bed occupancy conducted by the Hospital Council of Western Pennsylvania. Fourteen short-term general hospitals were included in the study. All of these hospitals maintained medical-surgical services, 13 maintained obstetric sections, and 11 maintained pediatric sections.

The variable and constant vacancy rates were computed for each of these services of the hospitals. The authors give the formula for determining these rates, as follows:

"Constant vacancy is the percentage of a hospital's total bed complement that is unoccupied every single day. It is computed most simply by subtracting the highest daily census from the total bed complement, multiplying by 100, and dividing by the total bed complement.

"Variable vacancy rate represents the average percentage of bed complement that is sometimes vacant, exclusive of those beds that are continuously unoccupied. It is computed most simply by subtracting the constant vacancy rate from the total vacancy rate." The latter is the difference between 100 and the occupancy rate.

Variation in demand in the medical-surgical services was much less than in pediatrics and obstetrics, because of the larger size of the former services and the number of elective admissions possible. Variable vacancy in the 14 hospitals ranged from 4 to 21 percent. The median was 13 percent, as compared with 26 percent in maternity and 35 percent in pediatrics. The variable vacancy in six hospitals was less than 10 percent, for three hospitals it was only 4 percent.

The authors suggest that "any hospital in which the medical-surgical vacancy rate exceeds 10 percent should explore means of reducing the number of beds in use. Medical-surgical services should be able to operate at 90 percent of occupancy or higher." This may be accomplished through stabilization of daily census fluctuations, by avoiding rigidities of assignment of medical-surgical beds by pay status, sex, or clinical specialty, by equitable waiting list management, and by coordination of admissions among hospitals.

20. McNerney, Walter J., et al. Hospital and Medical Economics: A Special Report on the Michigan Study. Hospitals 35:17-24, August 1, 1961.

The Michigan Governor's Commission on Prepaid Hospital Care was established to explore prepayment costs, benefits, and coverage. The article summarizes a report submitted to the Commission.

Four segments were considered in their relation to the voluntary health system: the population (the consumers of health care); the providers of care; prepayment, insurance, and government; and groups exercising controls.

The consumers of care. -- A population survey was made, using a probability sample of approximately 1,000 families (3,500 persons). This survey disclosed that more than half of all persons 65 and over and one-third of all low income persons have no health insurance at all. Since in the total population, only one-fifth lack health coverage, the principal problem of meeting the costs of medical care falls upon the aged and the low income groups.

The providers of care. -- A representative sample of 47 hospitals was studied. Nearly 11,000 patient records of these hospitals were in turn studied to obtain data regarding age, sex, diagnosis, and treatment of patients.

The findings were: Those 65 and over stay twice as long as those under 65, their average bill is 83 percent higher, and they have the least prepayment and insurance protection.

Effectiveness of hospital use was studied by panels of medical specialists through records of 5,750 cases covering 18 selected diagnoses to determine the presence or absence of faulty admission, overuse, or underuse.

Findings: The underuse of diagnostic and treatment procedures was fairly common. Approximately 30 percent of the patients did not receive the services established by medical judgment to be required for their condition. The length of stay was regarded as appropriate in more than 80 percent of the cases. When the patient paid for his own care, understay was far more common than overstay. When whole or partial payment was made from any other source, overstay was twice as common as understay.

The effectiveness study demonstrated that the principal health need of the population is "increase in the ability of all the population 65 and over to achieve comprehensive insurance or prepayment coverage."

Since the study disclosed that hospitals with less than 50 beds were found to have the largest total ineffective use of any group, it was recommended that the minimum acceptable size for the acute general hospital should be set at 50 beds for the purposes of Hill-Burton construction aid, accreditation, and Blue Cross participation. If smaller hospitals are considered essential because of geographic location, it was recommended that they be licensed for only limited and stated purposes.

As a result of an inventory of persons providing health care, it was recommended that aid be given for medical students, medical schools be expanded, and the use of paramedical personnel be increased.

In a sample of hospitals, interviews were conducted to determine construction plans. These revealed that "the least planning was found to be in the area of greatest need (chronic, rehabilitative, nursing home, psychiatric)," and "the greatest expansion is planned in areas of least need (acute, short-term)." Extension of coverage and better planning were seen as the measures to correct this situation.

Among the recommendations concerning hospitals were that rates should be based on the full cost for each service, as determined by cost analysis, plus an allowance for capital needs and community services.

Prepayment, insurance, and government. -- Questionnaires were sent to the prepayment plans and to commercial insurance firms, and a comparison of benefits available was made. The adverse effect upon Blue Cross of the practice of experience rating was discussed. Four problem areas for health care related to the government are enumerated.

Controls. -- Suggestions are offered for improvements in the control of quantity of service, of quantity in terms of facilities, of quality, and of cost control.

21. Odoroff, Maurice E. and Abbe, Leslie Morgan. Use of General Hospitals. Public Health Reports 72:397-403, May 1957; 72:478-483, June 1957; and 74:316-324, April 1959.

This study is divided into three sections relating to the use of general hospitals: demographic and ecologic factors, factors in outpatient visits, and variations with methods of payment. It was based on data obtained in a sample household survey on a national scale, conducted by the Bureau of the Census through supplemental questions asked in its regular monthly current population survey.

The sample included about 27,000 households consisting of approximately 90,000 persons of all ages. For each family a history was obtained of hospitalization and outpatient care received by each of its members during the 12-month period prior to September 1956.

The purpose of the study was to serve as an aid in defining standards of need by identifying the circumstances which accompany varying levels of use.

The section of the study devoted to use of inpatient care in general hospitals by demographic and ecologic factors analyzes use by sex and race, age, employment status and industry, region and type of residence, residence and place of care, and reason for admission and place of care.

Similar analyses were made of the use of outpatient care in general hospitals. The findings showed substantial differences in the rate of outpatient visits accompanying variations in race, sex, age, and employment status.

Other findings of the survey present data regarding method of payment for care as related to age, to family income, and to reasons for admission. Information is also included as to general hospital use by prepayment protection status, analyzed in relation to various factors.

22. Roemer, Milton I., M.D. and Shain, Max. Hospital Utilization Under Insurance. Hospital Monograph Series No. 6. Chicago, Illinois, American Hospital Association, 1959. 39 pp.

This monograph is a study of the determinants which affect the rate of utilization of hospitals under insurance. The factors influencing utilization are divided into three groups: patient, hospital, and physician determinants. After analyzing these factors, suggestions are made as to how the effect of each of these on high utilization can be minimized.

The patient-related determinants which influence the days of care in hospitals are: incidence and prevalence of illness, attitudes toward illness, the cost of medical care to the patient, marital status, and housing and social level. It is pointed out that many conditions formerly accepted as either normal or inevitable are now recognized as illnesses and that the extent of chronic illness has increased enormously, so that the rate of recognized illness per 1,000 population seems to be rising.

The hospital determinants which affect the rate of hospital utilization are stated to be: the supply of beds, the efficiency of bed utilization, the financing of hospital costs, the availability of alternative bed facilities, and outpatient services.

The relative supply of beds whose use is financed through insurance, the authors believe, will necessarily influence the decision of physicians concerning the admission of patients to hospitals. The greater the supply of beds, the less they are used in relationship to illness need. The authors suggest that some kind of governmental authority may eventually be required to determine the number of beds under all types of ownership in all localities. The maintenance of the highest possible occupancy in order to maintain income may be lessened by administrative surveillance of hospital insurance plans. The availability of facilities to meet the needs of long-term patients who do not really need the services of the general hospital would reduce hospitalization rates. The authors recommend also that the potentialities of the hospital outpatient department be developed.

The supply of physicians, the method of medical remuneration, the nature of community medical practice, medical policies in the hospital, the level of medical alertness, and medical teaching needs comprise the physician determinants which are analyzed as influencing hospital use.

23. Roemer, Milton I., M.D. The Distribution of Hospital Beds Needed in a Region.
Journal of Health and Human Behavior 1:94-101, Summer 1960.

The author questions whether the distribution ratios of hospital beds as originally established under the Hospital Survey and Construction Act (Hill-Burton) are still valid. The law was enacted, he states, largely to improve facilities in rural areas.

Hospital utilization has been directly affected by the varying urbanization trends in the densely and the sparsely populated States. In the densely populated States, while the larger cities have grown in population, there has also been a growth of suburban areas and the small towns have increased in size. In the sparsely settled States, people have tended to migrate to the metropolitan centers, and the population of rural areas and small towns has become smaller.

Hospital utilization has also been influenced by the tendency of rural and small town residents of sparsely settled States to by-pass their local and district hospitals and to travel to urban centers for medical care. However, in densely populated States the level of medical care in the small towns seems to be satisfying the public demand. This has resulted in greater pressure for hospital beds in the larger centers of the more rural regions than in the larger cities of the areas of high population density.

The author analyzes hospital usage statistics of Saskatchewan, Canada, which is similar to certain of the less highly populated States of this country. He finds rural and small town residents there have used the large regional and base centers to far greater degrees than had been anticipated. "The greater the rurality, the greater the apparent tendency of people to by-pass the small rural or even the district hospital and to seek care in the larger regional and base hospitals in the big cities."

In addition, occupancy rates of hospitals of the five most thinly and the five most densely settled States (in the continental United States) were compared. In the latter, hospitals in the smaller towns are being used at a relatively high occupancy level. However, this is not true of the thinly populated States.

From this analysis of occupancy statistics and from the study of hospital use in Saskatchewan, the author concludes that in the densely populated States or hospital regions the basic priority plan of the Hill-Burton program is still a reasonable one. However, in the sparsely populated States the need for beds in the largest cities seems to be much greater than was contemplated in the original plan, since the rural families seemingly are becoming increasingly oriented toward the larger cities for their medical care. Therefore, the author believes that an adjustment of the Hill-Burton program to give more weight to the larger cities of rural hospital regions would seem to be indicated.

24. Roemer, Milton I., M.D. The Influence of Prepaid Physician's Service on Hospital Utilization. Hospitals 32:48-52, October 16, 1958.

It is often concluded that health insurance which would include physician's care in the office and home would be more economical, since it would provide care under the least expensive circumstances and reduce the hospital admission rate. The author tests this hypothesis through analysis of hospital utilization in Saskatchewan, Canada, where for ten years the entire population had been covered by hospitalization insurance which had almost no limitations. Data are compared for those persons covered both by hospitalization and by various programs for physician's care and those covered only by hospitalization.

The findings of this study reveal that by either of two measures, that of cases admitted or in days of hospitalization per 1,000 persons per year, those whose prepaid physician's care was most complete had the highest rate of hospitalization. Those in the areas where there was no physician's care insurance had the lowest rates.

The author analyzes the reasons why prepaid medical care might reasonably be expected to heighten the rate of hospitalization. These include:

Case-finding. Since prepaid medical care increases calls on a physician, many conditions requiring hospitalization, which might otherwise have been undetected, are discovered. Superimposed on this basic mechanism are two related factors:

1. The saving in time by the physician. By hospitalizing a patient, many tests can be done by an auxiliary staff. Also, the physician can conveniently see all his seriously ill patients without the loss of time required to make home visits.
2. Fee inducements. The author states that economic pressures may sway the decision of a physician toward a patient's hospitalization in doubtful cases.

The author concludes that prepayment costs will not be reduced by combining hospitalization with coverage for complete physician's care. However, he states, this type of coverage should be evaluated in terms of health benefits, rather than entirely in terms of costs.

25. Shain, Max. An Epidemiological Approach to Hospital Utilization. Hospital Management 90:50-51, 113, October 1960.

The basis of the findings in this article is physician review of 953 consecutive records from three medium-sized general hospitals in central New York State for the month of February 1957.

This review revealed that about four percent of the admissions were classified as "questionable," which meant that "both the diagnostic and treatment services were characterized as procedures that could easily have been done outside of the hospital, or that no significant procedures were performed." By reason for hospitalization, patients admitted for "observation and/or diagnosis" and for "medical service" and two diagnostic groups, arthritis and rheumatism and accidents, had outstandingly high rates. There were notably high proportions of questionable admissions among men between 15 and 24 and women over 65.

Five percent of the total number of patients were judged to have been in the hospital for periods which were probably or definitely excessive. Women between 45 and 64 years of age comprised the only age and sex group with a signally high rate of excessive stay. Again, patients admitted for "medical service" and for "observation and/or diagnosis" comprised the two groups with high rates. Many of the patients with excessive lengths of stay might have received at least part of their care outside of an acute general hospital -- some through home care programs, others in nursing homes or chronic disease hospitals. It was realized that these latter types of facilities are not plentiful in small communities.

For the assistance of medical staff utilization committees, methods are presented for selecting cases for review.

26. Shain, Max and Roemer, Milton I., M.D. Hospital Costs Relate to the Supply of Beds. The Modern Hospital 92:71-73, 168, April 1959.

The authors point out that in the current discussions about "overutilization" a basic factor which has been overlooked is that "hospital beds that are built tend to be used." They state, "hospital beds are built in response to effective demand for hospital services, a demand which historically has been an expression of per capita income." The demand has been affected by hospitalization insurance, in that hospitalization is now available to families on different income levels.

Data are presented to substantiate their belief that "the more hospital beds are provided in a community, the more days of hospital care will be used," and that "more than 70 percent of the differences in hospital utilization by State and by county are associated with differences in bed supply." In 1940, before the increase in income and hospital insurance that followed the Second World War, the same high relationship between the bed supply of the States and the number of hospital days per thousand population was found.

The authors say that they do not know what the desirable limit to the bed supply is, that with the present number of beds per thousand in the country "untreated cases of disability are commonplace," and that further scientific advances and the greater number of people surviving to a greater age will add to the level of beds needed. "It might take 9 beds per thousand population.....to assure that every person receives treatment for every condition that interferes with his health and productivity."

27. Trussell, Ray E., M.D. and van Dyke, Frank. Prepayment for Hospital Care in New York State. New York, Columbia University School of Public Health and Administrative Medicine, 1959. 383 pp.

The authors state the projection of trends during the ten-year span 1947-1957 indicates that hospital costs will increase at least 50 percent by 1967. For this reason, efficient hospital utilization becomes increasingly important.

They list the three costly components of utilization as:

1. The fact of admission.
2. The services provided during hospitalization.
3. The length of stay.

To evaluate the need for hospital admission, 651 patient records in five hospitals were reviewed. It was found that 87 percent of the admissions appeared to be medically necessary. Eight percent of the admissions seemingly were not required on a medical basis, while for five percent it was not possible to form an opinion based on the information on the record. Therefore, it was concluded, it would appear from the results of the evaluation that in approximately one of every eight admissions, the necessity of that admission would require staff committee review.

The authors found no evidence that utilization of ancillary services by Blue Cross patients was excessive, when based on comparison of Blue Cross use of these services with that of patients with a comprehensive type of commercial insurance coverage.

The authors point out that unnecessary length of stay by hospital plan members constitutes a form of exploitation of all other members, as it increases the cost of the insurance payment. It also adds to the total community cost of medical care by increasing the construction costs necessary to provide facilities, since, if more people can be cared for in a year in a certain size hospital, the necessity for that expansion is lessened. Studies concerning length of stay in regard to the day of the week of admission and by other factors are included. It was found that there are wide variations in length of stay in different hospitals for patients with the same problems.

Among the recommendations made to effect more economical utilization are:

1. Ambulatory services, such as X-ray and laboratory tests, should be encouraged to minimize inpatient admissions.
 2. Every hospital should have a utilization committee to study matters pertaining to admissions, use of services, length of stay, and standards of care.
 3. Since the care of long-term patients in a general hospital may waste money and often does not meet the needs of the patients, the number of nursing homes should be increased. These homes should meet standards of care and should be related to general hospitals.
 4. A group should be established which would develop regional plans for facilities for medical and nursing care and approve construction of facilities for hospital and nursing care. This group would encourage maximum local or regional participation in self-study of utilization, standards, and needs.
28. U.S. Department of Health, Education, and Welfare, National Health Survey. Hospital Discharges and Length of Stay: Short-Stay Hospitals, United States, 1958-1960. Health Statistics Series B - No. 32. Washington, D.C., U.S. Government Printing Office, April 1962. 54 pp. (Public Health Service Publication No. 584-B32.)

Data for this study were collected between July 1958 and June 1960 in interviews of a continuous probability sample of the national civilian noninstitutional population. The sample consisted of approximately 75,000 households comprising 245,000 persons. The questions were designed to obtain information on the hospitalization experience of members of the sample household during the six-month period immediately preceding the interview. These data were adjusted to serve as a basis for the estimated annual number of hospitalizations. Only discharges from short-stay hospitals (those in which most patients stay for less than 30 days) are reported.

The findings are presented in a series of tables. They include data as to patient discharge and hospital days by age, sex, and other socioeconomic characteristics, type of hospital service, hospital ownership, and hospitalized conditions.

29. U.S. Department of Health, Education, and Welfare, Social Security Administration, Office of the Commissioner, Division of Program Research. Aged Beneficiaries of Old-Age and Survivors Insurance: Highlights on Health Insurance and Hospitalization Utilization, 1957 Survey. Social Security Bulletin 21:3-7, 32, December 1958.

The data in this article were obtained in a national survey of a sample of beneficiaries of Old-Age and Survivors Insurance in the fall of 1957. Only members of beneficiary groups who were aged 65 or over at the time of the survey were included.

Factors which contributed to differences in age group percentages between the beneficiary sample and the total population and those which influenced the ownership of health insurance among the sample population are explored. Two types of health insurance are designated -- insurance limited to hospitalization and insurance applicable to hospitalization and surgical expense.

Data comparing utilization of general hospitals by the insured and noninsured within the sample group are presented through several aspects including: the number hospitalized, the number of admissions, and the annual number of days of hospital care, for each 1,000 of the sample population by age group, sex, and marital status.

SUPPLEMENT

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